

5.0 SITE PARAMETERS

Assuming the certified design will be referenced for a wide range of sites, it is necessary to specify a set of site parameters enveloping the conditions that could be present at most potential power plant sites in the United States. These parameters are provided in Table 5.0-1. It is intended that any facility that references the certified design will utilize a site where the actual site-specific conditions are within the defined envelope.

In the case of seismic design parameters, deviations from the defined conditions may be justified by site-specific soil-structure interaction analyses. The results may be used to confirm the seismic design adequacy of the certified design using approved methods and acceptance criteria.

**Table 5.0-1—Site Parameters for the U.S. EPR Design
(3 Sheets)**

Precipitation	
Parameter	Value(s)
Rainfall rate	≤19.4 in/hr
Normal winter precipitation event ground load	≤100 psf
Normal winter precipitation event roof load	≤70 psf
Extreme liquid winter precipitation event roof load	0 psf ⁽¹⁾
Extreme frozen winter precipitation event ground load	≤43 psf (based on 55 inches)
Extreme frozen winter precipitation event roof load	≤30 psf
Extreme roof winter precipitation load	≤100 psf (100-year Mean Recurrence Interval)
Seismology	
Parameter	Value(s)
Horizontal SSE Acceleration	0.3g Peak (CSDRS shapes – See Figure 5.0-1)
Vertical SSE Acceleration	0.3g Peak (CSDRS shapes – See Figure 5.0-1)
Fault Displacement Potential	No fault displacement is considered for safety-related SSC in U.S. EPR design certification.
Flood Level	
Parameter	Value(s)
Maximum flood or tsunami	Maximum flood or tsunami level is no more than 1 ft below grade.
Temperature	
Parameter	Value(s)
Design ambient temperature	<p>The 0% exceedance maximum ambient temperature is 115°F Dry Bulb and 80°F Wet Bulb (mean coincident).⁽²⁾</p> <p>The 0% exceedance minimum ambient temperature is -40°F.⁽²⁾</p> <p>The 1% exceedance (seasonal basis)⁽³⁾ maximum ambient temperature is 100°F Dry Bulb and 77°F Wet Bulb (mean coincident).</p> <p>The 1% exceedance (seasonal basis)⁽³⁾ minimum ambient temperature is -10°F.</p>

**Table 5.0-1—Site Parameters for the U.S. EPR Design
(3 Sheets)**

Wind	
Parameter	Value(s)
Maximum Speed (Other than Tornado)	The normal maximum wind speed is 145 mph.
Tornado	
Parameter	Value(s)
Tornado (maximum speed, pressure drop, radius of maximum rotational speed, rate of pressure drop, missile spectra)	Maximum tornado wind speed of 230 mph. Maximum rotational speed of 184 mph. Maximum tornado pressure drop of 1.2 pounds per square inch at 0.5 psi per second. Radius of maximum rotational speed is 150 ft.
Soil	
Parameter	Value(s)
Soil properties:	
Minimum shear wave velocity	Minimum shear wave velocity (low strain best estimate average value at bottom of basemat) of 1000 feet per second.
Minimum static bearing capacity	Minimum static bearing capacity of 22,000 lb/ft ² in localized areas at the bottom of the Nuclear Island basemat and 15,000 lb/ft ² on average across the total area of the bottom of the Nuclear Island basemat. Minimum static bearing capacity of 3,800 lbs/ft ² in localized areas at the bottom of the EPGB basemat and 2,700 lbs/ft ² on average across total area at the bottom of the EPGB basemat. Minimum static bearing capacity of 17,800 lbs/ft ² in localized areas at the bottom of the ESWB basemat and 5,500 lbs/ft ² on average across total area at the bottom of the ESWB basemat.
Minimum dynamic bearing capacity	Minimum dynamic bearing capacity of 26,000 lb/ft ² at the bottom of the Nuclear Island basemat. Minimum dynamic bearing capacity of 10,800 lbs/ft ² at the bottom of the EPGB basemat. Minimum dynamic bearing capacity of 28,200 lbs/ft ² at the bottom of the ESWB basemat.
Liquefaction potential	No potential for liquefaction.
Maximum ground water level	Maximum ground water level is 3.3 ft below grade.
Maximum Differential Settlement (across the basemat)	1/2 inch in 50 ft in any direction.
Slope Failure Potential	No slope failure potential is considered in the design of safety-related SSC for U.S. EPR design certification.

**Table 5.0-1—Site Parameters for the U.S. EPR Design
(3 Sheets)**

Atmospheric Dispersion Factors (χ/Q)	
Parameter	Value(s)
Meteorological Dispersion (values at Exclusion Area Boundary, and Low Population Zone at appropriate time intervals for short and long term)	Atmospheric dispersion factors – χ/Q (sec/m ³)
	– Exclusion Area Boundary
	0 - 2 hours $\leq 1.00\text{E-}03$
	– Low Population Zone
	0 - 2 hours $\leq 1.75\text{E-}04$
	2 - 8 hours $\leq 1.35\text{E-}04$
	8 - 24 hours $\leq 1.00\text{E-}04$
	1 - 4 days $\leq 5.40\text{E-}05$
	4 - 30 days $\leq 2.20\text{E-}05$

1. The maximum 48-hour PMWP liquid of 32 inches is based on data obtained from National Oceanic and Atmospheric Administration Hydrometeorological Report No. 53 “Seasonal Variation of 10-square-mile Probable Maximum Precipitation Estimates, United States East of the 105th Meridian” for the three winter months – December through February. However, the effect of rainfall events on roof loads is negligible, due to the lack of parapets.
2. By definition, 0% percent exceedance temperature values exclude peaks of temperatures that last less than two hours. The 0% percent exceedance values are based on conservative estimates of 100 year return period values and historic extreme values, whichever is bounding.
3. For maximum values, data from the summer months of June, July, and August are used. For minimum values, data from the winter months of December, January, and February are used.

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